

**DN A01475 US**

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (canceled)

Claim 2 (previously amended): A precision fragmentation assemblage catalyst, wherein said catalyst comprises:

- (A) a precision fragmentation assemblage; and
- (B) at least one catalytic component;

wherein said precision fragmentation assemblage comprises:

- (i) a plurality of fragmentation domains; and
- (ii) one or more fragmentation zones;

wherein said fragmentation domain comprises at least one first polymer; and

wherein said fragmentation zone comprises at least one connecting phase, said connecting phase comprising at least one second polymer, said second polymer comprising at least one multi-ethylenically unsaturated second monomer, present as polymerized units, in an amount from 0.05 percent by weight to 100 percent by weight, based on the weight of the second polymer.

Claim 3 (original): The catalyst of claim 2, wherein said catalyst further comprises at least one activator component.

Claim 4 (original): The catalyst of claim 2, wherein said fragmentation zone further comprises at least one pore phase.

**DN A01475 US**

Claim 5 (original): The catalyst of claim 2, wherein said fragmentation zone further comprises plural polymeric nanoparticles comprising at least one third polymer.

Claim 6 (original): The catalyst of claim 2, further comprising one or more tether groups covalently bound to a polymeric chain, wherein said polymeric chain is a chain selected from the group consisting of said first polymer, said second polymer, and combinations thereof.

Claim 7 (original): The catalyst of claim 5, further comprising one or more tether groups covalently bound to a polymeric chain, wherein said polymeric chain is a chain selected from the group consisting of said first polymer, said second polymer, said third polymer, and combinations thereof.

Claim 8 (original): The catalyst of claim 2, wherein said catalytic component is an organometallic catalyst based on a metal, wherein said metal is a metal selected from the group consisting of metals of Group 3-11, lanthanide metals, actinide metals, and combinations thereof.

Claim 9 (original): The catalyst composition of claim 3, wherein said activator component is an activator component selected from the group consisting of organoaluminum compounds, organoaluminumoxane compounds, hydroxyaluminumoxanes, aluminoxinates, organic borane compounds, inorganic borane compounds, borate anions, and mixtures thereof.

Claim 10 (previously amended): An olefin polymerization process, wherein said olefin polymerization process comprises:

- (A) contacting at least one olefin monomer with at least one precision fragmentation assemblage catalyst;
- (B) polymerizing said olefin monomer to produce a polyolefin;
- (C) isolating said polyolefin,

**DN A01475 US**

wherein said catalyst comprises:

- (i) a precision fragmentation assemblage; and
- (ii) at least one catalytic component;

wherein said precision fragmentation assemblage comprises:

- (a) a plurality of fragmentation domains; and
- (b) one or more fragmentation zones;

wherein said fragmentation domain comprises at least one first polymer;  
and

wherein said fragmentation zone comprises at least one connecting phase,  
said connecting phase comprising at least one second polymer, said  
second polymer comprising at least one multi-ethylenically  
unsaturated monomer, present as polymerized units, in an amount of  
at least 0.05 percent by weight to 100 percent by weight, based on the  
weight of said second polymer.

Claim 11 (previously amended): A precision fragmentation assemblage wherein said  
assemblage comprises:

- (A) a plurality of fragmentation domains;
- (B) one or more fragmentation zones;

wherein said fragmentation domain comprises at least one first polymer; and  
wherein said fragmentation zone comprises:

- (i) one or more connecting phases;
- (ii) optionally, one or more pore phases; and
- (ii) optionally plural polymeric nanoparticles; and

wherein:

said connecting phase comprises at least one second polymer;  
said second polymer comprises at least one multi-ethylenically  
unsaturated monomer, present as polymerized units, in an amount  
of at least 0.05 percent by weight to 100 percent by weight, based  
on the weight of said second polymer; and

DN A01475 US

- said nanoparticles comprise at least one third polymer; and
- (C) one or more tether groups covalently bound to a polymeric chain, wherein said polymeric chain is a chain selected from the group consisting of said first polymer, said second polymer, said third polymer, and combinations thereof.

Claim 12 (previously presented): The precision fragmentation assemblage of claim 11, wherein said tether group comprises a functional group selected from the group consisting of epoxy, vinyl, allyl, primary amino, secondary amino, imino, amide, imide, aziridinyl, hydrazide, amidino, hydroxy, hydroperoxy, carboxyl, formyl, methoxycarbonyl, carbamoyl, sulfone, sulfine, sulfeno, thiol, thiocarboxyl, thioformyl, pyrrolyl, imidazolyl, piperidyl, indazolyl, carbazolyl, and combinations thereof.

Claims 13-17 (canceled)

Claim 18 (previously presented): The catalyst of claim 6, wherein said tether group comprises a functional group selected from the group consisting of epoxy, vinyl, allyl, primary amino, secondary amino, imino, amide, imide, aziridinyl, hydrazide, amidino, hydroxy, hydroperoxy, carboxyl, formyl, methoxycarbonyl, carbamoyl, sulfone, sulfine, sulfeno, thiol, thiocarboxyl, thioformyl, pyrrolyl, imidazolyl, piperidyl, indazolyl, carbazolyl, and combinations thereof.

Claim 19 (previously presented): The catalyst of claim 7, wherein said tether group comprises a functional group selected from the group consisting of epoxy, vinyl, allyl, primary amino, secondary amino, imino, amide, imide, aziridinyl, hydrazide, amidino, hydroxy, hydroperoxy, carboxyl, formyl, methoxycarbonyl, carbamoyl, sulfone, sulfine, sulfeno, thiol, thiocarboxyl, thioformyl, pyrrolyl, imidazolyl, piperidyl, indazolyl, carbazolyl, and combinations thereof.

**DN A01475 US**

Claim 20 (previously presented): The catalyst of claim 2, wherein said fragmentation domain has an average particle size of at least 0.002 microns to no more than 20 microns.

Claim 21 (new): The precision fragmentation assemblage of claim 11, further comprising an active ingredient.

Claim 22 (new): The precision fragmentation assemblage of claim 21, wherein said active ingredient is selected from pharmaceuticals, biocides, herbicides, mildewcides, insecticides, fungicides, fertilizers, cosmetics, fragrances, liquid crystals, colorants, enzymes, or combinations thereof.